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Spin-orbit coupling in Fe-based superconductors

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Abstract

We study the spin resonance peak in recently discovered iron-based superconductors. The resonance peak observed in inelastic neutron scattering experiments agrees well with predicted results for the extended s-wave (s ±) gap symmetry. Recent neutron scattering measurements show that there is a disparity between transverse and longitudinal components of the dynamical spin susceptibility. Such breaking of the spin-rotational invariance in the spin-liquid phase can occur due to spin-orbit coupling. We study the role of the spin-orbit interaction in the multiorbital model for Fe-pnictides and show how it affects the spin resonance feature. © 2013 Springer Science+Business Media New York.

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Keywords

Fe-based superconductors, Spin-orbit coupling, Spin-resonance peak